Quantitative $^{31}$P-NMR Analysis of Phospholipid Mixtures
Avanti Analytical Services Division

**What is Quantitative $^{31}$P-NMR?**
Quantitative $^{31}$P-NMR is an analytical technique that provides rapid, reliable characterization and quantitation of phospholipid species in a variety of matrices. The technique capitalizes on the wide variance of chemical shifts (ppm) in the phosphorus NMR spectrum for phospholipid classes, and the 100% isotopic abundance ensures accurate and reliable data (LOQ = 0.3 mM; %RSD = 2%). Depending on the matrix (e.g. soy, dairy, krill, sunflower), very robust, validated sample prep methods are used which allow for comprehensive analysis of most nutraceutical and liposomal formulations; an example is shown below. The response in mM concentration can be converted to weight/weight percent, mg per capsule, etc ...

**Why should I use $^{31}$P-NMR analysis for my samples?**
There are inherent challenges to quantitation of phospholipid mixtures by other techniques such as mass spectrometry. Extensive isobaric interference and differential ionization and fragmentation efficiencies for different lipid classes makes mass spectrometry a challenging technique. Additionally, a comprehensive reference standard and internal standard is needed to accurately quantitate each class. If you desire a single concentration for each lipid class with unparalleled accuracy in your nutraceutical or formulation product, the $^{31}$P-NMR method is ideal.

**How do I request $^{31}$P-NMR analytical services?**
To order $^{31}$P-NMR services, please visit the Avanti website and fill out a sample submission form. Alternatively, e-mail us at lipidomics@avantilipids.com if you have any additional questions about this service or other Avanti products and services.
The document contains two 31P-NMR spectra, one for a Dairy Product and another for a Krill Oil Product. Each spectrum displays chemical shifts in ppm, with annotations for various peaks identified with labels such as "LPE", "SM", and "PC". The peaks are located at specific chemical shifts, which are indicated by arrows and numbers next to each peak. The spectra are used to analyze the phosphorus-containing compounds in these products, providing insights into their chemical composition.

The graphs are labeled as follows:

- **31P-NMR Spectrum of Dairy Product**
- **31P-NMR Spectrum of Krill Oil Product**